

# Agricultural Research

**U.S. National  
Arboretum Finds  
Disease-Tolerant  
American Elms  
(Page 4)**

**Creating a Rainbow  
of New Flower Colors  
(Page 12)**





## ***Horticultural Research Is No. 1***

The culture and sale of shade trees, flowering shrubs, flowers, and bedding and foliage plants are big business in the United States.

According to a survey conducted by Gallup for the National Gardening Association, retail lawn and garden sales were almost \$26 billion in 1994. Those sales are being fueled by federal research to develop superior horticultural plants.

Few taxpayers realize that—besides the abundance of food and fiber crops developed by the Agricultural Research Service—countless trees, shrubs, and floral plants that they enjoy are products of ARS' U.S. National Arboretum.

In the nearly 70 years since it was established by an act of Congress, the arboretum has developed—through basic interdisciplinary research—more than 650 new varieties. Its northeast Washington, D.C., site covers 444 acres and serves as a world-class center for the improvement of trees, shrubs, and ground covers that landscape streets and gardens all over the United States.

Not only do our scientists create azaleas of many different colors and magnolias with longer bloom, they seek out—worldwide—landscape plants that are more cold tolerant and resistant to diseases, insects, and salt, or that can better survive the stresses of air pollution.

Just about any U.S. city has streets lined with one of the arboretum's most enthusiastically adopted contributions to the national landscape—three ornamental pear trees—Bradford, Whitehouse, and Capitol. In April, their showy white flowers are spectacular.

The Bradford pear, developed from seed from China, is among the 10 most widely planted ornamental trees

in the eastern United States. Beautifully shaped, it grows to 30 to 50 feet and resists urban pollution. Whitehouse and Capitol pears are slimmer and shorter than Bradford and not as likely to split at maturity.

Arboretum tree geneticist Frank S. Santamour, Jr., was the first to produce anthracnose-resistant sycamores by crossing a native eastern American species with a Turkish sycamore, or planetree. Anthracnose fungal disease is widespread in North America, affecting all three American sycamores.

Columbia and Liberty hybrid planetrees are also able to compartmentalize trunk wounds and so are more resistant to injury-caused decay. These sycamores are more suitable for planting in urban environments.

Before his death in 1990, arboretum horticulturist Donald R. Egolf developed varieties of many ornamental shrubs, such as pyracantha, viburnum, crape myrtle, and rose of Sharon. The arboretum has the world's only viburnum and crape myrtle breeding programs.

During his career, Egolf introduced 19 viburnums, including Shoshoni and Eskimo. Unlike most viburnums that are too large for home landscaping, these snowball-flowered dwarfs are ideal for foundation plantings, rock gardens, borders, and low hedges.

Nearly 30 varieties of crape myrtles developed and introduced by Egolf have been a great commercial success. They grow to a height of less than 16 feet, resist mildew, and flower in a range of new colors from light lavender to coral pink. The colors of their mottled bark vary throughout the year—from near-white to mahogany. Egolf's crape myrtles have been extensively planted throughout the southern, southwestern, and western United States.

Mohave pyracantha with its Chinese-red berries, disease resis-

tance, and cold tolerance has become one of the world's most widely grown new shrubs. Egolf bred it from 186 different crosses and then screened the crosses, narrowing them down to five. Next, he grew over 7,900 seedlings from the five crosses and sent them to 20 cooperators—universities, plant specialists, and nurseries across the United States—for a 5-year evaluation. In the end, just Mohave was deemed worthy of release, and now nurseries sell hundreds of thousands of dollars' worth each year.

Tree and shrub breeding is not for the impatient. It can take 12 years or longer to develop and perfect a new variety of shrub; a new tree, 25 years or more. Few, if any, private companies can afford to invest in such long-term work—which is why the U.S. National Arboretum and its Floral and Nursery Plant Research Unit at Beltsville, Maryland, are so important.

Yet, arboretum research goes far beyond varietal improvements, to developing and implementing new technologies for the U.S. floral and nursery industry.

Just about everyone who gardens has seen the USDA Plant Hardiness Zone Map. This chart is a decision-making resource that helps take some of the risk out of selecting plants suited to regional climates. Commercial growers use it to decide when to ship living plants so they will survive, if planted when received.

Besides its many research activities, the arboretum is a unique entity in ARS—serving as a national center for public education. Each year, almost half a million visitors enjoy its stimulating and aesthetically pleasing environment.

**Thomas S. Elias**

Director, U.S. National Arboretum

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# Agricultural Research

**New American Elms Restore Stately Trees 4**

**Trash or Cash Commodity? 9**

**Plant Pigment Puzzle Complete 12**

**Genetic Resistance a Key To Controlling Aflatoxin 14**

**Microbes Clean Up Wastewater 15**

**Geneplay Combats Cucumber Mosaic Virus 16**

**Drawing the Chicken Genome Map 19**

**Venture Into Agricultural Science—At Disney World 20**

**No Muss, No Fuss Spray Rig for Greenhouses 22**

**Science Update 23**

2

Cover: Whether disease-tolerant or just lucky, this stately elm survived Dutch elm disease as it wiped out 77 million U.S. trees since 1931. Photo by Scott Bauer. (K7310-2)